# THE CORK LINED HOUSE *makes a* COMFORTABLE HOME

# The Cork Lined House Makes a Comfortable Home

Reg. U. S. Pat. Off.

ARMSTRONG CORK & INSULATION CO.
PITTSBURGH, PA., U. S. A.

*Branch Offices and Representatives in the Principal Cities of the United States and Canada*

B-11

# Foreword

*Comfort a Matter of Temperature*

IN the home you are going to build, no matter how large or small, how elaborate or simple, one thing you require above all others is that it be comfortable. And since comfort is largely a matter of temperature, your house must be warm, free from drafts, and uniformly heated throughout in winter; and cool, upstairs and down, in summer. If your house is cold and drafty, you cannot be happy in it no matter how delightful, otherwise, it may be; nor can you take much satisfaction in upstairs rooms that are stifling hot on summer afternoons and nights.

*Ordinary Materials not Heatproof*

The home builder who has given thought to methods of house construction understands very well why most houses are cold, drafty, and expensive to heat in winter, and why they are hot in summer. The reason is simple: Heat passes readily through the materials of which houses are ordinarily built. Hence, a large portion of the heat from radiators or registers escapes through the walls and roofs in cold weather, and entirely too much of the sun's heat comes through them in summer.

Obviously, then, if we could construct our houses so that walls and roofs would be almost as heat tight as they are weather tight, what a difference it would make in their comfort in all seasons of the year, and how much less fuel it would take to keep them warm in winter.

**Insulation a Necessity**

That is exactly what is being accomplished by means of *heat insulation** and with such uniformly excellent results that the value of adequate insulation in promoting comfort and economy cannot be questioned. In fact, insulation is fast coming to be recognized as one of the most important factors in home construction. The time is not far off, if indeed it is not here now, when no really well-planned and well-built house will be erected without complete insulation of the outside walls and roof.

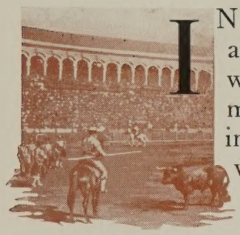
On the following pages it is clearly shown that by means of adequate insulation a house can be so effectually protected against outside temperatures that it can be kept much more comfortable, winter and summer; that it can be easily heated with considerably less fuel; and that it will require a smaller heating plant than would otherwise be needed. The essential factors to be considered in selecting an insulating material are fully explained, as well as the necessity for using an adequate thickness. These pages will repay very careful reading, for of insulation it is especially true that "What is worth doing at all is worth doing well."

**Insulation*, in building construction, means the use of a material that will greatly diminish the passage of heat in either direction through walls, roofs or ceilings.

Cabins of Arctic ships are often lined with cork for protection against cold

Stripping cork trees in Algeria. Cork is the outer bark of the cork oak tree which flourishes in the Spanish Peninsula and Northern Africa

## *Cork—Nature's Own Insulation*



IN Spain, Portugal, southern France and northern Africa are heavily wooded areas which, during the summer months, are subjected to scorching tropical sun and hot, parching winds. And during this season when vegetation is dried up and practically lifeless, one is surprised to see certain trees alive and flourishing, apparently and actually unaffected by the terrific heat.

*Nature Insulates Cork Trees*

These are the cork oaks, and they are able to survive because their trunks and branches are heavily sheathed with an outer bark of peculiar structure, which prevents the sun and wind from drying up their life-giving sap. Why the cork oak alone should be protected with this kind of covering we do not know. It is sufficient for us that it is so; that Nature has developed a heat *insulating* material unequaled in effectiveness by any of man's devices. And fortunate, too, for this bark is the *cork* of commerce, that indispensable material used almost from the dawn of history for stoppers and floats, and in recent years and in vastly greater quantities for the insulation of the walls and roofs of residences and commercial buildings.

*Cork a Mass of Air Cells*

The heat-resisting property of cork is due to its peculiar structure. Cork is made up entirely of minute air cells, each cell having imprisoned within it a tiny particle of air, too small to circulate inside the cell walls and so well sealed in that it cannot pass from one cell to another. Now it is well known to scientists and engineers that the most effective hindrance to the passage

In frame houses, Armstrong's Corkboard is nailed to the studs and rafters. Residence of Mr. Gus Jungling, Cincinnati, Ohio

of heat is just such a mass of minutely divided, *motionless* air, and Nature has incorporated it in the structure of cork in a way that is not equalled in any manufactured product. Cork is today universally recognized by all who deal with problems of heat and cold as the most efficient, practicable insulation known.

## *Its Practical Utility*

*Value of Cork Long Recognized*

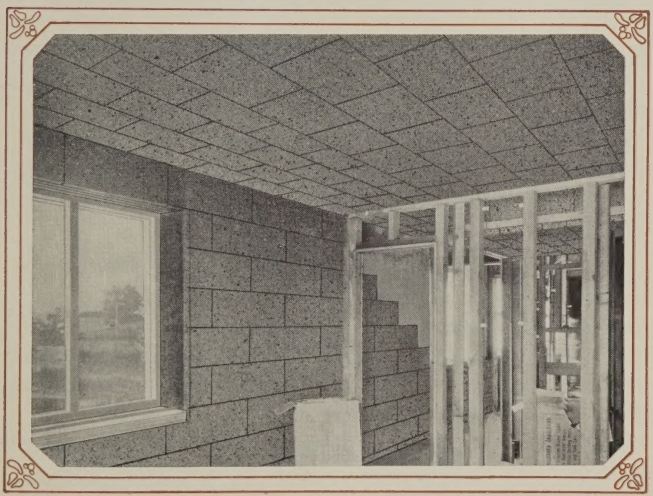
The heat-retarding value of cork has long been known and utilized. In the hilly districts of the Spanish peninsula many peasant cottages, and even more pretentious houses, may be found sheathed on walls and roofs with rough slabs of cork bark to keep out the heat of the sun and the chill of winter. But any such primitive use of cork is out of the question in

modern buildings. To take advantage of this unusual property of natural cork we must prepare the material in suitable form to be built into our houses and buildings in such a way as to utilize its full value and to insure its permanence as a part of the construction.

*Vital Points to be Considered*

It must be borne in mind that there are two factors to be considered in the choice of an insulating material for houses: (a) Heat-retarding Value, and (b) Structural Practicability. Under the latter should be included the following:

(1) *Structural strength.* The material should be strong enough to be easily handled and erected, and to stay permanently where it is put without cracking, loosening, or settling.



Armstrong's Corkboard is erected against brick, stone or hollow tile walls in a backing of Portland cement mortar. Dr. Frederick Herbert's residence, Elkins Park, Pa.

(2) *Nonabsorption.* It should not take up or retain moisture; otherwise it would lose its insulating efficiency (water being an excellent heat conductor), and become a source of mold and decay, damaging to the material itself as well as to the plaster and the construction against which it is erected.

(3) *Stability.* It is essential that any insulating material built into the construction have no appreciable expansion or contraction, and should not buckle or swell after being erected; otherwise serious damage is sure to result to plaster, trim, or roofing.

(4) *Vermin-proof.* It must provide no harboring places for rats, mice, insects, etc.

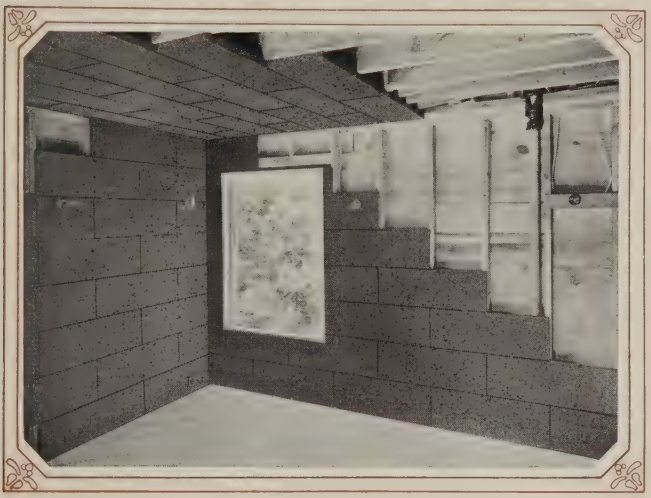
(5) *Fire-safe.* It need not necessarily be absolutely fireproof. But it should be slow burning, difficult to ignite, and incapable of smoldering or of carrying fire.

(6) *A good base for plaster.* The best place for insulation is on the inside of the walls and the underside of the roof rafters or top-ceiling joists. It should, therefore, be capable of taking the plaster direct without the use of lath, and afford a base that will minimize cracking.

(7) *Reasonable in cost.* The slightly higher net cost of the insulated house should be no more than the annual saving in heating cost will repay in a very few years. In other words, the investment should be a good one from the financial standpoint as well as from that of added comfort and satisfaction.

***Must Meet Every Requirement***

All of these points must be given full consideration. For example, a material may have a high insulating value when new and dry, but a very low one if and when it becomes damp through moisture absorption. Simi-



The residence of Mr. C. W. Rice, Schenectady, N. Y., is insulated with Armstrong's Corkboard, one and one-half inches thick, on the exterior walls and second floor ceiling

larly, an inflammable or vermin-attracting material becomes a menace to safety no matter how suitable it may otherwise be. The insulation finally chosen should be the one which in every respect meets the full list of these exacting, but nevertheless essential, requirements.

## *Armstrong's Corkboard Insulation*

*Used for 25 Years*

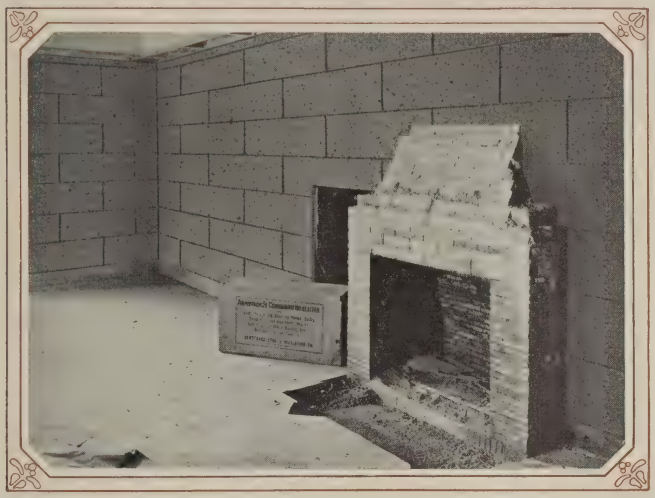
For more than 25 years Armstrong's Corkboard has been used in the construction of industrial and commercial buildings in which insulation is necessary for protection against differences in temperature. Every year many millions of board feet of Armstrong's Cork-

In stucco construction, Armstrong's Corkboard may be erected on the outside of the walls with the stucco applied over it. Residence of the Misses Eckford, Little's Point, Swampscott, Mass.

board go into the building of cold storage houses and rooms, refrigerators, tanks, on the roofs of industrial buildings to reduce heat transmission and to prevent condensation, and into the walls and roofs of residences.

*Made of Pure Cork*

Armstrong's Corkboard is made of granules of pure cork carefully screened free of all dust and foreign matter. The granulated cork is compressed in molds and subjected to a baking process which liquefies the natural gum and so cements the granules into a solid mass. The corkboard comes from the molds in boards which are trimmed to a uniform width of 12 inches and to lengths of 32 or 36 inches. Armstrong's Corkboard is supplied in 1, 1½, 2, 3, 4 and 6-inch thicknesses.



Armstrong's Corkboard, one and one-half inches thick, set against stone walls in Portland cement mortar. Dr. L. B. Wilson's residence, Rochester, Minn.

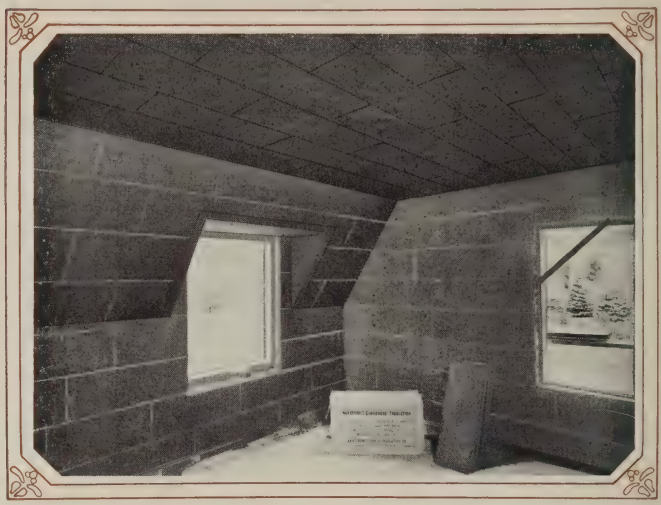
The thicker boards are used in cold storage insulation. 1½ and 2 inches being the thickness most used in house insulation.

*Light in Weight*

Armstrong's Corkboard weighs less than one pound per board foot, (a square foot one inch thick). It is very easily handled and can be readily cut with a saw. Its surface is filled with innumerable shallow, irregular depressions which serve as an excellent key for plaster so that no lath need be used with corkboard.

## *Insulating Value*

While it is true in the strictly technical sense that all materials conduct heat to a greater or less degree,



Armstrong's Corkboard, one and one-half inches thick on the walls and two inches thick on the second floor ceiling, will keep the home of Mr. R. L. Brewster, Denver, Colo., comfortable the year 'round

***Conductors and Insulators***

it is common practice among engineers to separate them into two classes: *Conductors* and *insulators*. The *conductors* are those through which heat travels rapidly or quite perceptibly. The *insulators* are the materials through which the transfer of heat is very slow. In common parlance insulators are those materials which "stop" the heat.

The following table gives an idea of the wide variation in the conductivity of different substances:

| | |
|---|---|
| Copper | 2547. to 2588. |
| Steel | 312.5 to 315. |
| Slate | 10.37 |
| Brick | 5.22 |
| Concrete | 3.2 to 4.7 |
| Wood, (average) | 1.02 |
| Armstrong's Corkboard | .304 |

The conductivities are expressed as the number of B.t.u., (British thermal units, the standard unit of heat quantity) which are transmitted in one hour through one square foot of the material, one inch thick, for one degree Fahrenheit difference in temperature between the two sides.

*Cork a Good Insulator*

To divest this of technical terms, assume the rate of heat travel through Armstrong's Corkboard to be 1. Then the rate through wood is 3.36; concrete, 15.47; brick, 17.15; steel 1036. In other words, heat travels through brick work, for example, 17.15 times as fast as through Armstrong's Corkboard, or expressed in another way, 17.15 times as much heat passes through brickwork as through Armstrong's Corkboard, assuming the same thickness and conditions.

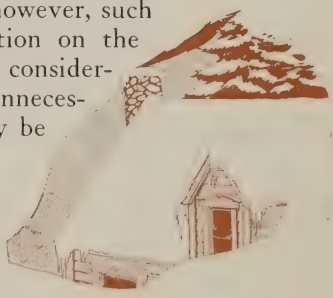
*Ordinary Materials Poor Insulators*

All commonly used building materials—stone, concrete, tile, brick, stucco, house plaster, slate, lumber, etc., are, relatively, heat conductors rather than insulators, since the rate of heat flow through them is rapid. In other words, a distinct and in most cases quite a large volume of heat passes through these materials in the thicknesses ordinarily used.

*Thick Walls are Expensive*

Now of course, it would be possible to reduce this heat leakage by greatly increasing the thickness of the walls and roof of a home. For example, a brick or stone wall might be made 24, 30 or 36 inches thick, or 6, 8 or 10-inch thicknesses of lumber might be used, and thereby greatly lessen heat loss. Manifestly, however, such construction is entirely out of the question on the score of expense alone, to say nothing of considerations of space, weight, etc. And quite unnecessary also, for the result we are after may be





So little heat is lost through the roof of the cork lined house that the snow does not melt

easily and inexpensively attained by lining the walls and roof with a sufficient thickness of Armstrong's Corkboard Insulation.

*Effect of Armstrong's Corkboard*

The remarkable effect on heat transmission of adding Armstrong's Corkboard to standard construction is best shown in the following table:

| WALL CONSTRUCTION | Transmission in B.t.u. per sq. ft. per hr. per deg. Fahr. diff. in temp. without insulation | Transmission in B.t.u. per sq. ft. per hr. per deg. diff. in temp. insulated with 1½ inches of Armstrong's Corkboard |
|---|---|---|
| 6-inch hollow tile plastered both sides | 0.28 | 0.12 |
| 6-inch concrete | 0.35 | 0.13 |
| 8-inch brick, furring, lath and plaster | 0.21 | 0.10 |
| 4-inch brick, sheathing, studding, lath and plaster | 0.21 | 0.10 |
| 4-inch brick, 6-inch hollow tile, plaster | 0.24 | 0.11 |
| Clapboards, sheathing, studding lath and plaster | 0.23 | 0.12 |
| Stucco, studding, lath and plaster | 0.39 | 0.13 |
| ROOF CONSTRUCTION | | Insulated with 2 inches of Armstrong's Corkboard |
| Slate and sheathing | 0.42 | 0.11 |
| Shingles, sheathing and rafters | 0.35 | 0.11 |

It will be noted that the insulation reduces the heat transmission through the wall or roof to a half, or a third, or in some cases even less, of that of the uninsulated construction.

## *Other Advantages*

*Strong in Structure*

*Armstrong's Corkboard is a firm, rigid board* with ample structural strength. Properly erected, it will not break away from the construction, and, of course, cannot settle like loosely packed materials. It neither expands nor contracts, nor does it in any way change in form or lose in strength no matter how long it may remain in place.

Armstrong's Corkboard provides a permanent and thoroughly satisfactory base for all kinds of interior plaster. Mr. Arthur M. Lowenthal's residence, Rochester, N. Y.

Armstrong's Corkboard was used on the outside walls, upstairs ceilings and all partitions in the home of Mr. C. F. Colbert, Jr., Aspinwall, Pa. The cork insulation makes the two-story living room easy to heat

**Unaffected by Moisture**

*Armstrong's Corkboard is nonabsorbent of moisture.* Built into the walls and roof, it remains perfectly dry and free from rot and mold. It affords an effective barrier against the penetration of moisture from outside the building. This matter of moisture absorption is one of the most important to be considered in connection with house insulation.

**No Capillary Attraction**

At this point it is well to examine a very vital difference between the *cellular* type of insulation, such as corkboard, and the *fibrous* class which includes almost all other insulators. Fibrous insulations of all kinds have one characteristic which is inherent in their fibrous structure and inseparable from it, namely, capillarity—a rather technical term for a very common

The plaster on the exterior walls of this room was applied directly to Armstrong's Corkboard. Mr. M. C. Poffenberger's residence, Detroit, Mich.

property. It means the natural tendency of any material made up of fibers to "soak up" or absorb moisture in the manner of a sponge or lamp-wick. This tendency is extremely difficult, if not impossible, to overcome, various methods of moisture-proofing having been tried with indifferent success except for temporary effect.

*Free from Mold and Decay*

Cork, on the other hand, is cellular, not fibrous. It has no capillarity and no tendency to absorb moisture. Therefore it does not decay, or mold, or disintegrate structurally. It is because of this structural permanence, in addition to its very high heat retarding value, that cork, in its manufactured form of corkboard, has come to be generally recognized as the most efficient, durable, and economical insulation.

The home of Mr. H. G. Crowder, Winnetka, Ill., is lined throughout with Armstrong's Corkboard, one and one-half inches thick on walls and two inches thick on the top floor ceiling

*Insulation Should be Moisture-proof*

It might be thought that there would be little danger of moisture reaching the insulation in a house; nevertheless, it can and does. Under ordinary conditions, all building materials are quite likely to be exposed, before or during construction, to rain or snow, and if they become wet they might better be thrown away than built into the house. For it must be understood that water is an excellent conductor of heat and its presence in any material practically destroys its insulating value. The result, of course, is the same if, after the house is finished, water gets to the insulation through leaks in the roof or wall, or by absorption during damp or rainy weather. A moisture absorbing material should never be used as insulation. Armstrong's

Corkboard is inherently nonabsorbent and can be used with complete assurance that it will remain so for the life of the building.

*Armstrong's Corkboard does not buckle or swell.* Armstrong's Corkboard has no appreciable expansion or contraction and is so thoroughly moistureproof that it does not swell or buckle after being installed. It is not necessary to make any allowance in the joints for movement or change of shape or size. The joints are laid tight and remain exactly as laid, not opening up by contraction or bulging by expansion.

***No Expansion or Contraction***

This characteristic of Armstrong's Corkboard is very important. Any material that "comes and goes" with changes in temperature or humidity is almost certain to do considerable damage to plaster and trim if not to the construction itself. Armstrong's Corkboard can be erected on walls or ceilings with the complete assurance of its stability.

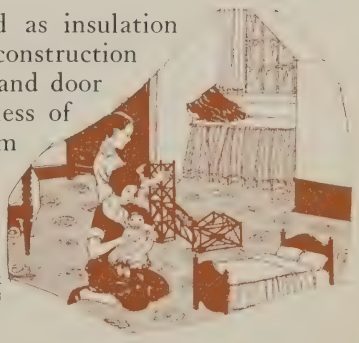
*Armstrong's Corkboard is fire safe.* It is an exceedingly slow burning material which does not smolder or carry fire. Flame in contact with corkboard produces a surface charring—a noninflammable coating—which serves effectually to check the spread of fire.

***Slow Burning and a Fire Retardant***

## *How Armstrong's Corkboard is Used*

The use of Armstrong's Corkboard as insulation involves no change whatever in house construction except increasing the depth of window and door frames in exterior walls by the thickness of the insulation. This is so small an item as to be almost negligible.





Third floor rooms in cork lined houses are as warm as those downstairs

*No Lath Required*

Armstrong's Corkboard is usually erected on the inside of the exterior walls and on the underside of either the roof rafters or second floor ceiling joists. Against studding, rafters or joists, the sheets of corkboard are simply nailed in place. Against brick, tile, stone, or concrete, they are erected in Portland cement mortar, without the use of furring strips. Various methods of application are shown in the illustrations throughout this book. The inside surface is then plastered in the usual way with any standard house plaster. No lath is required on insulated surfaces as Armstrong's Corkboard is itself an excellent base for plaster. Plaster on corkboard keys into the surface indentations and holds permanently and with a minimum of cracking. It is easier to apply than on lath.

Armstrong's Corkboard is light in weight, easily handled and readily cut with a saw. Since it neither expands nor contracts, no allowance need be made at the joints for swelling or shrinking.

## *The Thickness to Use*

*Adequate Thickness Essential*

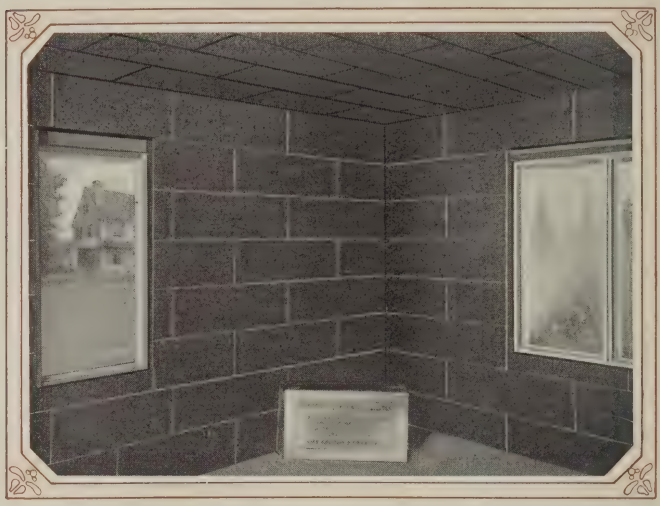
The prospective home builder will do well to consider very carefully whether in getting "insulation" he is really getting *enough* insulation to insure the results he desires. The term "insulation" is loosely and variously used to cover anything from so-called "air spaces" or a sheet of building paper to insulation that is genuinely effective. The heat retarding value of any material, practically speaking, is in proportion to its thickness. A sheet of building paper has, of course, *some* insulating value, but so little as to be quite ineffective. The mere fact that a certain material has

a conductivity lower than that of the ordinarily used building materials does not by any means qualify it as efficient, economical insulation irrespective of the thickness in which it is used. The thickness of even the best of insulators, corkboard for example, must be such as to afford the degree of insulation that, in terms of comfort gained and fuel saved, will more than justify its cost. A little insulation may cost more than it is worth, whereas *enough* insulation is worth far more than it costs.

*1½ Inches on Walls*

The thickness of insulation which will effect the desired results and at the same time make the maximum economic return on the investment depends

Armstrong's Corkboard, one and one-half inches thick, set in Portland cement mortar against cinder block walls in the residence of Mr. H. W. Prentis, Jr., Lancaster, Pa. The ceiling insulation is two inches thick



The lining of Armstrong's Corkboard in the home of Mr. N. P. Benson, Minneapolis, Minn., makes feasible the use of city gas for heating

*2 Inches on Roofs*

somewhat on climatic conditions and upon the construction with which it is to be used. In general, however, it may be stated that one and a half inches of Armstrong's Corkboard should be used on exterior walls and two inches on the roof or top floor ceiling. To use less, except where unusual conditions may justify a slight reduction in thickness, is to forego much of the benefit of adequate insulation without making a proportionate saving in cost.

These recommendations as to thickness are based on this Company's experience of over 25 years in supplying insulation for almost every conceivable condition and are designed to afford the home builder the maximum value for the lowest practicable cost.

*Compare Equal Thicknesses*

In considering insulating materials recommended in thin sheets, the home builder should bear in mind that the actual benefits of insulation are, practically speaking, in proportion to the thickness used, and that no material has a heat retarding value sufficiently high to justify its use in less than one-inch thickness. *Furthermore, in order to get the true relation between insulating value and cost, all comparisons should be made on the basis of equal thickness.*

## *The Results of Insulation*

The effect of lining walls and roof with Armstrong's Corkboard is primarily to increase their resistance to the passage of heat in or out so that much more of the heat delivered from registers or radiators stays inside the house, and less of the outside heat of summer penetrates to the living quarters.

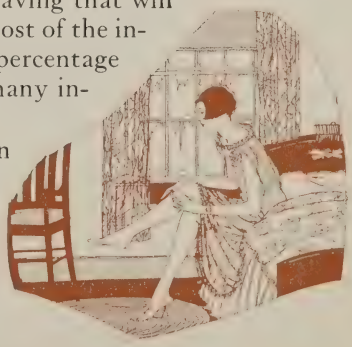
As a result, the cork-insulated house is so much easier to heat that it can be kept comfortably warm with appreciably less fuel, and with a heating plant considerably smaller than the house would require if it were not insulated.

*Reduces Size of Heating Plant*

These two economies represent the money saving features that, from the strictly investment standpoint, make house insulation well worth while. The reduction in heating plant capacity is a first cost saving that will ordinarily pay about 60% of the gross cost of the insulation, leaving its net cost a very low percentage of the value of the house, as little in many instances as 1% or 2%.

The lower fuel consumption is an annual saving which, in four or five





Cork lined houses warm up quickly in the morning

seasons at most, should entirely repay the net cost of the insulation.

*Saves One-third of Fuel*

In the average house it is estimated that about 45% of the heat loss is through doors, windows, etc. This loss is not preventable. The other 55% escapes through the walls and roof, and it is this waste that insulation reduces. Applying the results shown on the table on page 14 to a typical brick-veneer house with a slate roof, we find that Armstrong's Corkboard insulation reduces the wall and roof loss by 60%. The net heat saving is therefore 60% of 55%, or 33%, which means, of course, an equivalent saving in fuel.

The following letter from owners of cork insulated houses give eloquent testimony on the two points just mentioned.

*Gas Bill for Year $130.80*

Under date of August 11, 1925, Mr. W. H. Larimer, Richland Lane, Pittsburgh, Pa., wrote:

> "I have been checking up my gas bills for the past winter and would like to tell you what I have found. As you know, our house is brick and hollow tile against which is cemented two-inch corkboard; that is to say, the walls and roof are lined with two-inch corkboard. All the windows and doors are caulked and weather stripped. We use a gas furnace and hot water heat.
>
> "The gas was lighted October 22, 1924, and from this date to October 15, 1925, our total gas bills amounted to $130.80, using 60-cent gas. No other fuel was used and the temperature ranged from 70 to 72 degrees both night and day. Included in this total is the gas used for cooking, Ruud hot water heater, laundry, garage, etc. About the middle of January we had the garage insulated with two-inch corkboard which, of course, cut down the gas consumption there. In the garage we use a small gas heater.
>
> "You will understand that we heat the entire three floors and find all parts of the house comfortable and the temperature practically uniform."

Computation from carefully kept records shows that of the total of $130.80, $32.80 was for gas used for cooking, hot water supply, laundry, etc., and $98.00 for heating. It is estimated that, without insulation, the item of heating cost alone for this house would have been $145.00, a saving of $47.00 or 32%.

*Size of Heating Plant Reduced 31%*

With respect to the practicability of reducing the size of the heating plant in a cork-lined house, read what Dr. J. W. W. Walker, Auburn, N. Y., has to say in his letter of December 18, 1925:

> "Since the installation of Armstrong's Corkboard in my residence last fall, the boiler has maintained such an even temperature throughout the house, and we have been so comfortable during this severe early winter, that I feel certain specific data will be of interest.
>
> "The residence is a large country house of thirteen rooms capacity, remodeled from an eight room structure, and is located on a rise of ground on the edge of town where the wind has full sweep over the fields.
>
> "Under ordinary construction 825 square feet of radiation would have been necessary, whereas 567½ square feet were installed—or a reduction of approximately 31.2%.

*Comfortable at 10 Below Zero*

Later, December 28, 1925, Dr. Walker wrote as follows:

> "It may be of interest to you to read the enclosed newspaper clipping in todays "Citizen," stating that yesterday [December 27] was the coldest on record in Auburn: the temperature was 10° below zero accompanied by a 50-mile gale of wind. It will be further of interest to know that my house was perfectly comfortable, maintaining an average temperature of 72° throughout the house.
>
> "I feel this is as good a test as could be desired by anyone. Thanks to Armstrong's Corkboard my house is all that can be desired from the standpoint of warmth."

Residence of Dr. James W. W. Walker, Auburn, N. Y., insulated with Armstrong's Corkboard. Note Dr. Walker's letters on the preceding page

## *The Comfort Factor*

*Comfort the Basis of Satisfaction*

But after all, for most people, the investment feature of the house is secondary. The social and domestic aspects outweigh the financial. We build for the satisfaction, comfort, and security we expect to enjoy in the home. Anything within reason that can be incorporated into the house to make it more comfortable adds to it a satisfaction value beyond computation in money terms. A lining of Armstrong's Corkboard enhances the liveability of the house in many ways.

In the first place such a house can be *uniformly* heated. You know how most houses are: there is

usually a "cold side", or one or more rooms that are "hard to heat." In the cork lined house, the heat loss through the exterior surfaces is so slight that the warmth becomes evenly distributed and remains so. There is no marked difference between upstairs and downstairs, between north side and south side. The whole house is comfortable—living room, dining room, bedroom or attic.

*Cork Lined Houses Heat Uniformly*

Second, the cork lined house stays warm overnight; the insulation holds in the heat. Of course bedrooms that are opened at night get cold, but when they are closed in the morning and heat turned on, they warm up in a fraction of the time required in an uninsulated house. You don't have to dress in the bathroom. The "heat response" of the cork lined house is very rapid. The temperature comes up quickly because practically none of the heat is lost through the construction.

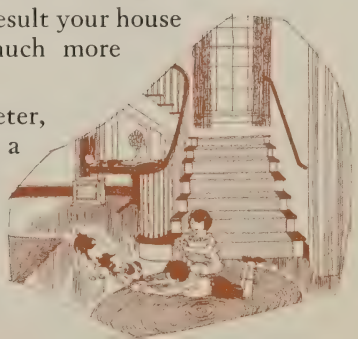
*Cork Lined Houses Warm Up Quickly*

Third, the cork lined house is much freer from drafts. Draftiness is largely due to cold walls and ceilings. Warm air coming in contact with them is chilled quickly and falls, setting up a circulation quite noticeable in large rooms and particularly in halls and stairways where all the chilled air from upstairs pours down to the lower floor. Where the walls are warm, as they are when lined with Armstrong's Corkboard, the cooling of the air is much less rapid, and circulation and draftiness greatly reduced. As a result your house is not only more comfortable, but much more healthful.

*Cork Lined Houses are Free from Drafts*

Fourth, the cork lined house is quieter, and drier. Armstrong's Corkboard is a sound-deadener and its use in walls and





Cork lined houses are free from drafts

roof shuts out sounds from the street and neighboring houses. Used in partitions it isolates each room and affords a privacy not possible with partitions as ordinarily built.

*Walls Always Dry*

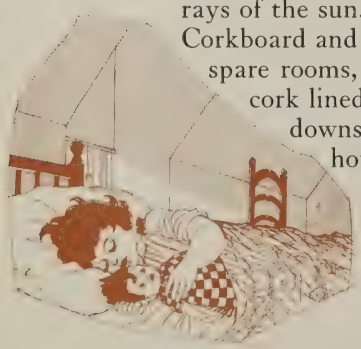
Armstrong's Corkboard is nonabsorbent and virtually impermeable to moisture. Walls in which it is used will always be perfectly dry and free from condensation.

## *Cool in Summer*

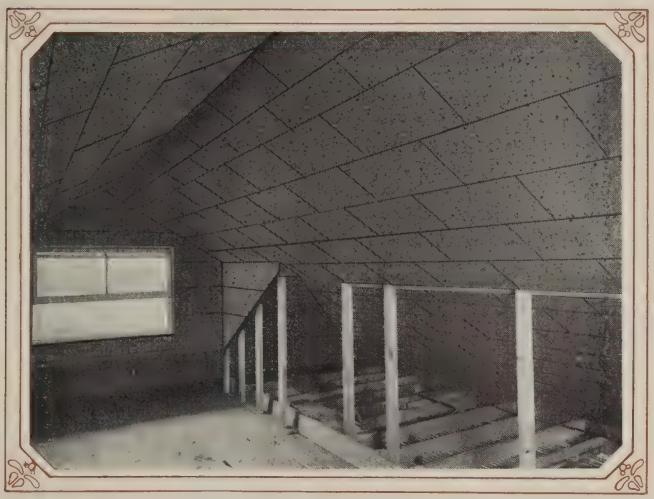
In summer, conditions are reversed. The higher temperature is *outside* and the effect of the insulation is to retard the passage of heat *inward* through the construction. Think of the midnight hours you have spent on the porch waiting for the upstairs to cool off, and of the unbearable temperature in attic rooms on an August afternoon and you will better appreciate what it means to have your house protected from the summer heat.

*Bedrooms Are Cool*

The cork lined house is many degrees cooler. This is especially true of the upper floors because of the protection afforded by the insulation on the roof or top-floor ceiling. In uninsulated houses, most of the heat comes in through the roof, it being usually of light construction and exposed all day to the direct rays of the sun. Shut out this heat with Armstrong's Corkboard and the attic becomes available for pleasant spare rooms, play rooms, or maids' quarters. In the cork lined house the upstairs is as comfortable as downstairs, and temperatures throughout the house are noticeably lower than in other houses, no matter how well built,



Cork lined houses are cool on hot summer days



The roofs of existing homes can be easily lined with Armstrong's Corkboard, as shown here. Residence of Mr. E. A. Reynolds, Chicago, Ill. (See page 31)

which lack the advantage of heat-proofed walls and roofs.

## *Not Expensive*

*Moderate in Cost*

Insulation with Armstrong's Corkboard is easily within the cost limits of every house that is worth building well. It is not expensive. Its use need not increase the expense of building by more than 2% of the cost of the house. In many cases it is less, and in all cases the amount is such as will be entirely repaid by the fuel savings of four or five seasons at most. The example cited on page 24 is typical.

Can you think of any other equal investment which returns such generous dividends in money and enjoy-

*A Good Investment*

ment? The comparatively small amount expended to insulate your house with Armstrong's Corkboard not only pays itself back in money saved on fuel at the rate of 25% to 33⅓% a year, but as long as your house stands, it insures a degree of comfort and satisfaction not obtainable in any other way. And if you ever want to sell, the fact that your house is insulated with Armstrong's Corkboard and the record of your low fuel requirements will materially increase its resale value.

## *Insulation of Existing Houses*

*Easy to Insulate Existing Houses*

Insulation with Armstrong's Corkboard is by no means limited to new houses. In houses already built, it is a very simple matter to insulate the roof, or the top-floor ceiling. (See the illustration on page 29.) If the attic space is unfinished and accessible, all that is necessary is to nail the corkboard to the underside of the rafters; it may be finished with plaster or not, as desired. Or the corkboard may be nailed over the top floor joists and either floored over or left uncovered if the space is not to be used. Also, when re-roofing, corkboard may be laid on top of the sheathing and the new roof applied over it. In this way one of the worst heat leaks in the house can be effectually stopped with results in added comfort and fuel economy that amply justify the small expense and labor involved.

When old frame houses are to be covered with stucco, the walls can be just as easily and effectively

insulated with Armstrong's Corkboard as in the case of new houses. The corkboard is simply nailed on the walls. Magnesite stucco may then be applied directly on the corkboard without the use of metal lath or wire mesh. In the case of cement stucco, it is advisable to use the wire or metal lath.

Armstrong's Corkboard can be nailed over clapboards, siding or shingles and then finished with stucco, as shown here. Mr. Harry Dreuding's residence, Elkins Park, Pa. (See page 31)

Full information will be furnished for the insulation of existing houses upon receipt of a description of the construction and conditions.

## *Further Information*

More detailed information on the properties and uses of Armstrong's Corkboard, estimates of cost, sources of supply, etc., will be supplied to all who are planning to build or remodel houses.

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